An Account of the Speaking Trumpet, *as it hath been contrived and publiſhed by Sir* Sam. Moreland *Knight and Baronet; together with its Uſes both at Sea and Land. Printed at* London *An.* 1671.

THe Author of this Inſtrument relateth *firſt* the ſeveral Tryals made with it; of which the moſt conſiderable was, that the biggeſt of thoſe that have been as yet employ'd, turn'd Trumpet-wiſe, being 5 foot 6 inches long, and of 21 inches diameter at the great end, and 2 inches at the little; When by his Majeſties ſpecial command it was tryed more than once at *Deal* Caſtle by the Governour thereof, the voice was plainly heard off at Sea, as far as the Kings Ship's uſually Ride, which is within two and three miles, at a time, when the wind blew from the ſhore.

Next, He diſcourſeth of the Nature of Sounds, and the Manner, How he conceiveth them to be magnified or multiplyed by this Organ. Where he obſerveth, 1. That a ſmall Tube (*e.g.* that of an ordinary Trumpet) does not at all magnifie Sounds, Words, or Syllables. 2. That 'tis neceſſary, the diameter of the leaſt end of one of theſe Inſtruments be equal to (if not greater than) the diameter of the orifice of the Speakers mouth, and that what it wants of that, ſo much the leſs does the Inſtrument magnifie the Voice. 3. That the Inſtrument muſt be enlarged by degrees, and not too ſuddenly. 4. That the Mouth-piece of it muſt be ſo applyed and adapted to the Speakers mouth, that no Air or Breath be loſt, and yet the Mouth have free liberty of opening and ſhutting, that ſo the Articulation be entirely preſerv'd. 5. That the Point, where the voice is moſt magnified, is the Center of its greater Orifice. 6. That the turning and winding of this Inſtrument, either Trumpet-wiſe, or in any other Circular figure, is ſo far from prejudicing it, that it the rather ſtrengthens the voice. 7. That (as he with ſubmiſſion conceives) the Voice, as it is tranſmitted through this Inſtrument from the Mouth, endeavors all the way to ſpread and dilate it ſelf by Spherical Undulations; but

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finding Oppoſition on every ſide, maketh a percuſſion in every point of each imaginary circle of the Tube; and again, that the percuſſion made in every ſuch Circle, being reundulated to the Center of each of them, maketh there a much ſtronger percuſſion than that which was made in any ſingle point or part of ſuch Circle, foraſmuch as it may be preſumed, that all the percuſſions, made in any of thoſe Circles, are united in their ſeveral Centers; and that the percuſſion in the Center would again dilate it ſelf by a Spherical Undulation, but meeting with oppoſition in every point of the Tube, an entire Cone of imaginary rays of Sound are reverberated to ſome Center, in like manner as the Sun-beams are reverberated from a poliſht ſuperficies of a *parabolical* Concave to its proper *focus*. And that therefore, as the Tube enlarges it ſelf, and the Circles both of Reundulation and Reverberation become greater, there muſt needs be imagined (according to him) a greater number of Reundulating Circles and Reverberating Rays, to meet in each reſpective Center and *Focus*, whereby the ſame voice is greatly augmented. 8. As to the Demonſtrative part of this Tube, and the exact Figure and Dimenſions of it, he propoſeth to Mathematical Philoſophers this Problem, *viz.*

> *What is the Right-lined, Curvi-lined, or Mixt Figure; and what are its exact Dimenſions; and what the Sphere of its activity, that beſt and moſt magnifies Human Voyce?*

Laſtly, He ſubjoins the Uſes of this Inſtrument; as, 1. *That* in a Storm, or in a Dark night, when two Ships dare not come ſo near one another as to be heard by any ordinary voice, by this Tube they may very eaſily ſpeak together at half a mile or a miles diſtance, or more, if need be, eſpecially if alternately they take the advantage of the Wind: And if that be ſo ſtrong, that but one of the Ships can ſpeak with the Wind, the other may anſwer by ſigns, though directly againſt it. 2. In a Storm it is of good uſe in a ſingle Ship, for hearing one Man giving order to all in a Ship. 3. By it an Admiral may in a Calm give immediate Orders to his whole Fleet; as alſo a Governour may convey his Orders from a

Sea-Port to Ships riding at a pretty diſtance in the Road. 4. In caſe of a cloſe Siege, by this Inſtrument, at one, two, or three miles diſtance, the *Beſieged* may be told, by ſpeaking in *Cypher*, that there is Relief coming, and how great, and when: And, on the other ſide, the *Beſiegers* may thereby threaten and diſcourage the *Beſieged*, in a ſpatious Town. 5. By this means a General may ſpeak himſelf to his whole Army; an Herald may make a proclamation, to be diſtinctly heard by many thouſands; an Overſeer of Works, give orders to many hundreds of Workmen, without changing his ſtation; Officers and others, in caſe of a great Fire, where uſually people are in an hurry, may ſo govern the Aſſiſtants as to prevent diſ-order and confuſion; Houſe-keepers, in caſe of Thieves attacking an Houſe remote from Neighbours, may immediately call upon all the Dwellers round about, within a mile or more, and inform them of the Houſe where the robbery is made, the number of the Thieves, how dreſſed and armed, and which way they are gone, *&c.*

The Author doubts not but this Invention may be much improved: But, as to his *Probleme* above-expreſſed, it ſeems, to us, that that muſt be ſetled by Experience (rather than Demonſtrations,) there being a complication of ſo many *phyſical* Accidents, that the neglect of ſome one Un-heeded, may ſoon defeat a demonſtration, deduced from ſome other of them.